State Highway Bridge #16 (Old Riverside Park Bridge)
Spanning the Kickapoo River,
on Old State Highway No. 131
La Farge Vicinity
Vernon County
Wisconsin

HAER No. WI-64

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
Rocky Mountain Regional Office
National Park Service
U.S. Department of the Interior
P.O. Box 25287
Denver, Colorado 80225

HAER
WIS,
62-LAFA.V,
2-

HISTORIC AMERICAN ENGINEERING RECORD

State Highway Bridge No. 16
(Old Riverside Park Bridge)

HAER No. WI-64

Former Location:	Spanning the Red Cedar River at Menomonie, Wisconsin
Present Location:	Spanning the Kickapoo River on Old State Highway #131 La Farge vicinity, Vernon County, Wisconsin UTM: 15.691600.4831375 Quad: La Farge, Wisconsin
Date of Construction:	1905 (Menomonie) 1952 (reassembled over Kickapoo River)
Present Owner:	State of Wisconsin
Present Use:	Demolished
Significance:	Bridge No. 16 was significant for its Warren truss design features, as well as for its role in the history of transportation in the Upper Midwest.
Historians:	Dr. John O. Anfinson and Ms. Jane Lamm Carroll St. Paul District, Corps of Engineers

DESCRIPTION

Bridge No. 16, formerly one of two identical truss spans that comprised the Riverside Park Bridge over the Red Cedar River in Menomonie, Wisconsin, conformed closely to the general description of a Warren truss bridge, a common bridge design used in the late 19th and early 20th century for railroad and highway bridges across the United States. Bridge No. 16 had diagonals alternately placed in either tension or compression, and was easily recognizable by its triangular outline. Bridge No. 16 had vertical members added to strengthen the structure. True Warren trussces have equilateral triangles and have horizontal upper and lower chords. The upper chord on Bridge No. 16, however, is polygonal, reaching a height of 27.2 feet in the middle, allowing for a vertical clearance of 14.8 feet. Framed in structural steel, and providing a roadway width of 17 feet, 6 inches, the span was 145 feet long, with an asphalt-covered timber decking. The sway bracing on bridge No. 16 had knee braces. Bridge No. 16 was in some ways typical of the Warren truss type, but not the most common form of the design.

Overall, few changes were made to the original span, known as the Riverside Park Bridge, when it was rebuilt over the Kickapoo River in 1953 and renamed Highway Bridge No. 16. A new guide rail was added, the stringers reinforced with metal plates, and the roller nest replaced with a structural steel plate. Since 1953, no significant changes have been made to the bridge. Thus, at the time of demolition, the superstructure appeared almost exactly as it did in 1905, when it was built.

STATE HIGHWAY BRIDGE NO. 16, FORMERLY THE RIVERSIDE PARK BRIDGE AT MENOMONIE, WISCONSIN

Bridge No. 16 was originally one of two identical Warren truss spans that made up the Riverside Park Bridge, which carried State Highway No. 29 over Red Cedar River in Menomonie, Wisconsin. The Riverside Park Bridge was built in 1905 and dismantled in 1952. Its two spans were reassembled at different points over the Kickapoo River in Wisconsin. The bridge placed 3-3/10 miles north of La Farge, Wisconsin, became Bridge No. 16. The other span was placed south of La Farge and eventually destroyed.

Menomonie began as a lumber town in the 1840s and grew to be a center of the industry in the red Cedar River Valley during the course of the 19th century. The Knapp, Stout and Company, which established its first sawmill at Menomonie, wielded substantial economic power in Red Cedar Valley. Indeed, by 1873, Knapp, Stout and Company was the largest lumber company in the world. Consequently, Menomonie was very much a "company town" throughout the 19th century. The Knapp, Stout and Company owned most of the major businesses in the town, as well as much of its real estate and the town newspaper, The Dunn County Lumberman. The company controlled Red Cedar River, its dams, landings, stores and had built roads and finishing mills. Knapp, Stout and Company platted Menomonie, paid over one million dollars in taxes, and was the largest employer in the region.

As the timber in the region was depicted during the last quarter of the 19th century, agriculture and light manufacturing became increasingly important to Menomonie's economy. The town also became a significant educational center, with the establishment of experimental educational institutions by James Huff Stout.

Menomonie was on the route of U.S. Highway #12, the major thoroughfare between Chicago and the Twin Cities. Alvin Karpis, declared as "public enemy number one" by the F.B.I. in 1933, referred to Menomonie as the "town with the crooked bridges." Gangsters travelling from Chicago to the Twin Cities passed over the "crooked road" in Menomonie, which included bridges over Wilson Creek and the Riverside Park Bridge, that were nearly perpendicular to one another.

The Riverside Bridge was manufactured in 1905 and erected in 1906 by the Minneapolis Steel and Machinery Company, a company, which, although involved in diverse aspects of steel manufacturing, began mass producing bridges in the early 1900s. The bridge facilitated highway traffic across the Red Cedar River at Menomonie for 47 years. The dismantling and relocation of the bridge over two locations on the Kickapoo River demonstrated the versatility and reusability of pre-manufactured steel truss bridges. Although Bridge No. 16 lost its integrity in terms of its original setting and design (because Bridge No. 16 was only one of two spans that made up the Riverside Bridge), it nevertheless remained a good example of the Warren truss design, as well as playing a role in the history of transportation in the region. Bridge No. 16, as a typical Warren truss steel bridge, also provided a "unifying structural and visual element within the American landscape," as it functioned in both rural and urban settings and represented a design commonly used for American highway bridges in the early 20th century.

WARREN TRUSS BRIDGES

Truss bridges are based on the geometric form of the triangle and provide a rigid structure, using a minimum of material. The design uses many small pieces that join together in a series of triangles. The triangles interconnect with each other and the main members are either stiff, heavy posts or thin, flexible rods. Trusses can be above or under roadways. They resist loads placed by gravity on the structure by each of the parts being put either in tension or compression. Truss bridges were first built in Europe, but became popular in America in the late 18th century. [1]

The first truss bridges were wood, but over the course of the 19th century, trusses of wood and iron were introduced. The first all-metal truss bridges in America were designed by Squire Whipple. In 1847, Whipple published an essay giving the first scientific analysis of a truss. Shortly thereafter, several methods of analyzing trusses developed. [2] The Warren truss, patented in 1848 by British engineers, was quickly adopted by American bridge designers. Its simple design was so successful that it is still used today. A Warren truss has diagonals alternately placed in either tension or compression and is easily recognized by its triangular outline. The Warren truss bridge is one of the two most common designs built in America after 1850. [3] Unlike the bridge trusses of American designers, the "Warren trusses are statistically determinate and hence it is possible to predict with confidence that certain members will always be in tension and that others will always be in compression." [4]

Metal structures and parts were introduced gradually to bridges in America. The major factors leading to the greater use of metal in bridges were: the decreased cost of wrought iron, the greater availability of rolled iron products and the introduction of steel; the scarcity of usable timber and the corresponding increase in its cost; the greater convenience and lower cost of field operations in handling and erecting metal parts; and wooden structures caught fire and decayed more rapidly. After the Civil War, bridge and general construction companies formed to meet the increased demand for iron. Some of these companies operated exclusively as bridge builders and many were formed by patentees to construct a single bridge design. [5]

The expansion of the railroads and the decrease in the cost of iron were the two most significant reasons metal truss bridges multiplied in the second half of the 19th century. [6] As railroad technology improved and locomotives got bigger, wooden truss bridges could no longer carry the heavy loads. The first metal trusses were cast iron and wrought iron; later in the 19th century, they were of steel. Railroad bridges collapsed frequently during the second half of the last century because bridge engineering did not keep pace with advances in railroad technology. Cast iron was too brittle for use with the heavier locomotives, and it often gave way. Although wrought iron was four times as strong as cast iron, it too finally gave way under the ever-

increasing loads of the new locomotives. Steel was the answer to the problem, because it had the strength of cast iron and the flexibility of wrought iron. The first all-steel bridge was built over the Mississippi at St. Louis in 1874. [7] By 1890, steel could be manufactured economically enough for use in all bridge sizes. Bridges could be sized, precut, riveted, drilled, and fitted at the manufacturing site and then reassembled at the bridge site. Between 1880 and 1910, metal bridge companies enjoyed a heyday of success. [8]

The economy, efficiency and strength of metal truss bridges made them popular in both rural and urban communities across America. By 1925, metal truss bridges--the Warren and Pratt types, in particular--were the most common bridges built in America. As a result, two leading authorities on bridge history assert that the ubiquitous presence of these bridges "provides a unifying element within the American landscape." [9]

Iron and steel bridges, like those of the Warren truss design, were originally developed to carry the immense weight of steam-powered locomotives. Due to their economy and efficiency, the metal truss configuration of railroad bridges was quickly used in highway construction, enabling the extensive expansion of America's infrastructure. This occurred at a time (1890-1920) when the size and density of America's population was increasing rapidly, and enabled a greater integration of rural and urban areas, both economically and socially.

FOOTNOTES

1 Robert Silverberg, Bridges, Philadelphia: Macrae Smith Company, 1966, pp. 61-62.

2 Derrick Beckett, Bridges, London: Hamlyn Publishing, 1969,, p. 93.

3 T. Allan Comp and Donald Jackson, "Bridge Truss Types: A Guide to Dating and Identifying," American Association for State and Local History Technical Leaflet #95, 1977, pp. 3, 8.

4 H. J. Hopkins, A Span of Bridges, New York: Praeger Publishers, 1970, p. 131.

5 Llewellyn Edwards, A Record of the History and Evolution of Early American Bridges, Orono, Maine: Maine University Press, 1959, p. 95.

6 Ibid., p. 98.

7 Silverberg, pp. 64-65, 70.

8 Dan G. Deisler, "Metal Truss Bridges in Virginia: 1865-1932," Virginia Highway and Transportation Research Council, May 1975, p. 13.

GENERAL BIBLIOGRAPHY

Beckett, Derrick. Bridges. London: Hamlyn Publishing, 1969.

Black, Archibald. The Story of Bridges. New York: Whittlesey House, 1936.

Comp, T. Allan and Donald Jackson. "Bridge Truss Types: A Guide to Dating and Identifying." American Association for State and Local History Technical Leaflet #95. History News. Volume 32. May 1977.

Condit, Carl. American Building: Materials and Techniques From the First Colonial Settlements to the Present. Chicago: The University of Chicago Press, 1968.

Deisler, Dan G. "Metal Truss Bridges in Virginia: 1865-1932." Virginia Highway and Transportation Research Council. May 1975.

Edwards, Llewellyn. A Record of the History and Evolution of Early American Bridges. Orono, Maine: Maine University Press, 1959.

Hopkins, Harry J. A Span of Bridges. New York: Praeger Publishers, 1970.

Minneapolis Steel and Machinery Company. Annual Reports, 1916-1920. Minnesota Historical Society Reference Library.

Minneapolis Steel and Machinery Company. Bulletins, 1916-1920. Minnesota Historical Society Reference Library.

Silverberg, Robert. Bridges. Philadelphia: Macrae Smith Company, 1966.

Thomas, Norman. "Minneapolis Moline, a History of its Formation and Operations." Ph.D Thesis, University of Minnesota, 1953.

Tyrell, Henry G. A History of Bridge Engineering. Chicago: Tyrell Publishing, 1911.

MENOMONIE, WISCONSIN, REFERENCES

Curtis-Wedge, Franklin. History of Dunn County, Wisconsin. Minneapolis: H. C. Cooper, Jr. and Company, 1925.

Owens, Roxanne. Intensive Survey Report of Menomonie, Wisconsin. Madison: State Historical Society of Wisconsin, 1987.